In the claims

The following amendments are made with respect to the claims in the International application PCT/EP2003/010983.

This listing of claims will replace all prior versions and listings of claims in this application.

1 (Currently amended). A [[M]]method selected from the group consisting of:

i) a method for the in vitro or in vivo degradation of amorphous or crystalline silicone dioxide (condensation products of the silicic acid, silicates), silicones and other silicon (IV)- or metal (IV)-compounds as well as of mixed polymers of these compounds, wherein a polypeptide or a metal complex of a polypeptide is used for the degradation, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1;

ii) a method for the synthesis of amorphous silicone dioxide (condensation products of the silicic acid, silicates), silicones and other silicon (IV)- or metal (IV)-compounds as well as of mixed polymers of these compounds, wherein a polypeptide or a metal complex of a polypeptide is used for the synthesis, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1; and

iii) a method for the modification of a silicic acid or silicon(IV)- or metal (IV)-compound-containing structure or surface, wherein a polypeptide or a metal complex of a polypeptide is used for the modification, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase

domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1.

2 (Currently amended). The [[M]]method for the synthesis of amorphous silicone dioxide (condensation products of the silicic acid, silicates), silicones and other silicon (IV)- or metal (IV)-compounds as well as of mixed polymers of these compounds, according to claim 1, wherein a polypeptide or a metal complex of a polypeptide is used for the synthesis, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1.

3 (Currently amended). The [[M]]method according to claim 2, characterized in that a compounds ~~such as~~ selected from the group consisting of silicic acids, monoalkoxysilantrioles, dialkoxysilandioles, trialkoxysilanoles, tetraalkoxysilanes, alkyl- or aryl-silantrioles, alkyl- or aryl-monoalkoxysilandioles, alkyl- or aryl-dialkoxysilanoles, alkyl- or aryl-trialkoxysilanes [[or]]and other metal(IV)-compounds [[are]] is used as a reactant[[s]] (substrates) for the synthesis.

4 (Currently amended). The [[M]]method according to claim 3, wherein mixed polymers having a defined composition are produced by using defined mixtures of the compounds.

5 (Currently amended). The [[M]]method according to ~~any of claims 2 to 4~~ claim 2, wherein the formation of defined two- and three-dimensional structures occurs by the polypeptide or a metal complex of the polypeptide or the binding of the polypeptide or

a metal complex[[es]] of the polypeptide to other molecules or the surfaces of glass, metals, metal oxides, plastics, biopolymers or other materials as a template.

6 (Currently amended). The [[M]]method for the modification of a silicic acid or silicon(IV)- or metal (IV)-compound-containing structure or surface, according to claim 1, wherein a polypeptide or a metal complex of a polypeptide is used for the modification, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1.

7 (Currently amended). The [[M]]method according to claim 6, wherein the silicic acid-containing structure or surface is present in form of a precious stone or semi-precious stone.

8 (Currently amended). The [[M]]ethod according to claim 6 ~~or 7~~, wherein the modification comprises a smoothing, an etching or the production of burrows of the silicic acid or silicon(IV)- or metal(IV)-compound-containing structure or surface by the polypeptide or a metal complex of the polypeptide.

9 (Currently amended). A [[C]]chemical compound or silicic acid-containing structure or surface, obtained according to a method ~~of the preceding claims~~ selected from the group consisting of:

i) a method for the in vitro or in vivo degradation of amorphous or crystalline silicone dioxide (condensation products of the silicic acid, silicates), silicones and other silicon (IV)- or metal (IV)-compounds as well as of mixed

polymers of these compounds, wherein a polypeptide or a metal complex of a polypeptide is used for the degradation, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1;

ii) a method for the synthesis of amorphous silicone dioxide (condensation products of the silicic acid, silicates), silicones and other silicon (IV)- or metal (IV)-compounds as well as of mixed polymers of these compounds, wherein a polypeptide or a metal complex of a polypeptide is used for the synthesis, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1; and

iii) a method for the modification of a silicic acid or silicon(IV)- or metal (IV)-compound-containing structure or surface, wherein a polypeptide or a metal complex of a polypeptide is used for the modification, characterized in that the polypeptide comprises an animal, bacterial, plant or fungal carbonic anhydrase domain that exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1

10 (Currently amended). The [[S]]silicic acid-containing structure or surface according to claim 9 in the form of a precious stone or semi-precious stone.

11 (Currently amended). A [[P]]polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:[[r.]] 1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence

similarity of at least 25% to the sequence shown in SEQ ID No. 1, a metal complex of the polypeptide, or a part[[s]] thereof.

12 (Currently amended). A [[N]]nucleic acid~~, in particular according to SEQ ID No. 2,~~ characterized in that it ~~essentially~~ encodes ~~for a polypeptide according to claim 11~~ a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, or a part thereof.

13 (Currently amended). The [[N]]nucleic acid according to claim 12, characterized in that it is present in the form of a DNA, cDNA, RNA or mixtures thereof.

14 (Currently amended). The [[N]]nucleic acid according to claim 12~~ or 13~~, characterized in that the sequence of the nucleic acid has at least one intron and/or a polyA-sequence.

15 (Currently amended). The [[N]]nucleic acid according to ~~any of claims 12 to 14~~ claim 12, in the form of its complementary "antisense"-sequence.

16 (Currently amended). The [[N]]nucleic acid according to ~~any of claims 12 to 15~~ claim 12 in the form of a (a) fusion protein- (chimeric protein) construct, (b) construct having a separate protein-expression (protease-cleavage site) or (c) construct having a separate protein-expression (cassette-expression).

17 (Currently amended). The [[N]]nucleic acid according to ~~any of claims 12 to 16~~ claim 12, characterized in that the nucleic acid has been synthetically produced.

18 (Currently amended). A composition of matter selected from the group consisting of:

i) a [[V]]vector, ~~preferably~~ in the form of a plasmid, shuttle vector, phagemid, cosmid, expression vector, retroviral vector, adenoviral vector or particle, nanoparticle or liposome, comprising a nucleic acid ~~according to any of claims 12 to 17~~ characterized in that the nucleic acid encodes a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, or a part thereof;

ii) a vector, in the form of a nanoparticle or liposome, comprising a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO: 1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, a metal complex of the polypeptide, or a part thereof; and

iii) a host cell, transfected with a vector or infected or transduced with a particle according to parts i) and ii) above.

19 -20 (Cancelled).

21 (Currently amended). The [[H]]host cell according to claim [[20]]18, characterized in that it expresses ~~a polypeptide according to claim 1, a metal complex of the polypeptide or~~

~~parts thereof~~ a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, a metal complex of the polypeptide, or a part thereof.

22 (Currently amended). The [[P]]polypeptide according to claim 11, characterized in that the polypeptide has been synthetically produced.

23 (Currently amended). The [[P]]polypeptide according to claim 11, characterized in that the polypeptide or the metal complex of the polypeptide is present in a prokaryotic or eukaryotic cell extract or lysate.

24 (Currently amended). The [[P]]polypeptide according to claim 23, characterized in that the polypeptide or the metal complex of the polypeptide is present being purified essentially free of other proteins.

25 (Currently amended). A [[M]]method for identifying [[of]] inhibitors or activators of a polypeptide of a silicase from Suberites domuncula according to SEQ ID No. 1 or a polypeptide being homologous thereto that in the amino acid sequence of the carbonic anhydrase domain has at least 25% sequence similarity to the sequence shown in SEQ ID No. 1, wherein a) a polypeptide of a silicase from Suberites domuncula according to SEQ ID No. 1 or a polypeptide being homologous thereto that in the amino acid sequence of the carbonic anhydrase domain has at least 25% sequence similarity to the sequence shown in SEQ ID No. 1 is provided, b) the polypeptide from step a) is

contacted with a potential inhibitor or activator, and c) the ability of the polypeptide is measured to degrade or synthesize silicate or silicones.

26 (Currently amended). The [[M]]method according to claim 25, wherein the polypeptide of a silicase from Suberites domuncula according to SEQ ID No. 1 or a polypeptide being homologous thereto that in the amino acid sequence of the carbonic anhydrase domain has at least 25% sequence similarity to the sequence shown in SEQ ID No. 1 is provided in vivo, in a cellular extract or lysate or in purified form.

27 (Currently amended). A [[M]]method for producing a pharmaceutical composition, comprising a) identifying [[of]] an inhibitor or activator according to claim 25 ~~or 26~~ and b) mixing of the identified inhibitor or activator with a pharmaceutically acceptable carrier or excipient.

28 (Currently amended). A method for the prevention or therapy of silicosis, wherein said method comprises administering a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, a metal complex of the polypeptide, or a part there or a nucleic acid characterized in that it encodes a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, or a part thereof ~~Use of a polypeptide or a nucleic acid or pharmaceutical composition according to any of the preceding claims for the prevention or therapy of silicosis~~.

29 (Currently amended). The method, [[Use]] according to claim 28, wherein the prevention and therapy of silicosis occurs by dissolving of quartz crystals.

30 (Currently amended). A [[U]]use of

a) a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, a metal complex of the polypeptide, or a part thereof; or

b) a nucleic acid characterized in that it encodes a polypeptide of a silicase from Suberites domuncula according to SEQ ID NO:1 or a polypeptide being homologous thereto, which in the amino acid sequence of the carbonic anhydrase domain exhibits a sequence similarity of at least 25% to the sequence shown in SEQ ID No. 1, or a part thereof;

wherein said use is selected from the group consisting of:

i) use of [[a]] said polypeptide or [[a]] nucleic acid ~~or pharmaceutical composition according to any of the preceding claims~~ for the resorption or for modulating the resorbability of silicones and silicone implants; and

ii) use of said nucleic acid for transfecting cells for the resorption or for modulating the resorbability of silicones and silicone implants.

31 (Cancelled).